In the following questions, input your answer as a numerical value. If you wish to use scientific notation, please use the following format. The number 1.8×10^{25} should be written "1.8e25" or as "1.8*10^25"

Measuring Gases

1.0/1.0 point (ungraded)
Solve the following problems pertaining to pressure. Please round your answer to three digits. Write your answer as a number only. Do not write the units.

A bronze statue of a person is placed inside a museum. The statue weighs $899.4\ \mathbf{kg}$, and the pedestal base of the statue has an area of $0.273\ \mathbf{m^2}$. When the pedestal is on the floor, what is the pressure, in $\mathbf{Pa}$, that the statue supplies? (For this problem, use the gravitational constant on Earth as $\mathbf{g} = 9.80665\ \frac{\mathbf{m}}{\mathbf{s^2}}$)

3.23e4 $\mathbf{Pa}$ ✔

Correct.

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✔ Correct (1/1 point)

Ideal Gases

1 point possible (ungraded)
For the following samples of gases, calculate the unknown value using the Ideal Gas Equation of State, $\mathbf{PV = nRT}$. Use the ideal gas constant $\mathbf{R}$ as $0.082057\ \frac{\mathbf{L\ atm}}{\mathbf{K\ mol}}$.

Write your answer as a number only, do not include the units. Please round your answer to three significant figures.

Consider the combustion of octane $(\mathbf{C_8H_{18}})$ in oxygen:

$$2\ C_8H_{18}\ (l) + 25\ O_2\ (g) \rightarrow 16\ CO_2\ (g) + 18\ H_2O\ (g)$$

You burn $4.72\ \textbf{moles}$ of octane in your car engine. What volume, in liters, of oxygen is needed if the pressure of your tank is $1.76\ \textbf{atm}$ and the temperature is $63.42\ ^\circ\textbf{C}$?

$\textbf{L}$

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Dalton's Law of Partial Pressure

3 points possible (ungraded)

For the following sample of gases, calculate the partial pressures of the components. Use the ideal gas constant $\mathbf{R}$ as $0.0820573\ \frac{\textbf{L atm}}{\textbf{K mol}}$.

Write your answer as a number only, do not include the units. Please round your answer to three significant figures.

Say you have another mixture of three gases: $\textbf{Ne}$, $\textbf{O}_3$, and $\textbf{N}_2\textbf{O}$. You have $14.4\ \textbf{moles}$ of $\textbf{Ne}$, $25.4\ \textbf{moles}$ of $\textbf{O}_3$ and $20.3\ \textbf{moles}$ of $\textbf{N}_2\textbf{O}$. These gases are held in a vessel with constant temperature and volume and a pressure of $15.6\ \textbf{atm}$. Assume no reactions occur.

Recall: $1\ \textbf{atm} = 1.01325\ \textbf{bar}$

a) Look at the first component, $\textbf{Ne}$. What is the partial pressure of $\textbf{Ne}$, in $\textbf{bar}$?

$\textbf{bar}$

b) Look at the second component, $\textbf{O}_3$. What is the partial pressure of $\textbf{O}_3$, in $\textbf{bar}$?

$\textbf{bar}$

c) Look at the third component, $\textbf{N}_2\textbf{O}$. What is the partial pressure of $\textbf{N}_2\textbf{O}$, in $\textbf{bar}$?

bar

Submit Grading method: Last Score

If after taking this Pre-Test you feel that you need to study this material, please review the sub-module entitled "Gases."